

AMENDMENTS TO THE CLAIMS

1. – 27. (cancelled).

28. (previously presented) A method for hydrotreating hydrocarbon feed oil including a sulfur-containing compound using at least two catalyst layers, comprising the steps of:

introducing hydrocarbon feed oil to the first catalyst layer together with hydrogen;

temporarily holding, by using a holding member, a liquid component that has flown out from the first catalyst layer, and stripping the liquid component with a first hydrogen gas stream that is fed from a hydrogen introduction part provided between the first catalyst layer and the second catalyst layer so that the first hydrogen gas stream passes through the liquid component as a countercurrent to the liquid component;

removing a vapor component that has been produced from the first catalyst layer and a vapor component that has been produced by stripping, while adjusting flow of the vapor component produced from the first catalyst layer and the vapor component produced by stripping in order to perform the stripping; and

introducing the stripped liquid component to the second catalyst layer together with and cocurrent with a second hydrogen gas stream that is fed from the hydrogen introduction part.

29. (previously presented) A hydrotreating method according to claim 28, wherein the holding member is a tray which has a liquid discharge hole and in which liquid component accumulates.

30. (previously presented) A hydrotreating method according to claim 28, wherein the holding member is a packing material through which the liquid component can pass.

31. (previously presented) A hydrorefining method according to claim 28, wherein the hydrocarbon feed oil is hydrocarbon oil in which 90 vol% distillation temperature is 250°C or higher.

32. (previously presented) A hydrorefining method according to claim 28, wherein the hydrocarbon feed oil has a 10 vol% distillation temperature of 220 to 300°C and a 90 vol% distillation temperature of 320 to 380°C, and the hydrorefined hydrocarbon feed oil has a sulfur content of not more than 150 ppm.

33. (cancelled).

34. (previously presented) The hydrorefining method of claim 28, comprising the further step of recycling hydrogen recovered from the removed vapor component into a hydrogen gas stream being introduced into the process.

35. (currently amended) A hydrorefining unit for hydrorefining hydrocarbon feed oil including sulfur-containing compounds, comprising:

a first catalyst layer and a second catalyst layer;

a holding member positioned between the first catalyst layer and second catalyst layer for temporarily holding a liquid component that flows out from the first catalyst layer, wherein said holding member is a valve tray;

a hydrogen feed source;

a hydrogen introduction part, that is connected to the hydrogen feed source, for simultaneously introducing hydrogen from the hydrogen feed source to the liquid component held in the holding member and the second catalyst layer, wherein the hydrogen introduced from the hydrogen introduction part has a first hydrogen gas stream and a second hydrogen gas stream;

a separation space that is positioned at the bottom of the first catalyst layer for separation of vapor component and

liquid component;

means for adjusting pressure of the separation space and/or a space between the holding member and the second catalyst layer; and

a gas outlet through which the vapor component is discharged from the separation space.

36. (previously presented) A hydrorefining unit according to claim 35, wherein said means for adjusting pressure comprises a flow meter and flow adjustment valve that are operatively connected to said gas outlet.

37. (previously presented) A hydrorefining unit according to claim 35, further comprising means for recycling hydrogen from the discharged vapor component into the hydrogen introduction part.

38. (previously presented) A hydrorefining unit according to claim 35, wherein the first catalyst layer, second catalyst layer, and holding member are housed in a single reaction vessel.

39. (previously presented) A hydrorefining unit according to claim 35, wherein the holding member is a tray which has a discharge hole for liquid component and in which liquid component accumulates.

40. (cancelled).

41. (previously presented) A hydrorefining unit according to claim 35, wherein impurities are stripped from the liquid component held in the holding member by the first hydrogen gas stream.

42. (previously presented) A hydrorefining unit according to claim 41, wherein the impurities are hydrogen sulfide and/or ammonia.

43. (currently amended) A hydrotreating unit for hydrotreating hydrocarbon feed oil including sulfur-containing compounds, comprising:

a first catalyst layer and a second catalyst layer;

a holding member positioned between the first catalyst layer and second catalyst layer for temporarily holding a liquid component that flows out from the first catalyst layer, wherein said holding member is a valve tray;

a hydrogen feed source;

a hydrogen introduction part, that is connected to the hydrogen feed source, for simultaneously introducing hydrogen from the hydrogen feed source to the liquid component held in the holding member and the second catalyst layer;

a separation space that is positioned at the bottom of the first catalyst layer for separation of vapor component and

liquid component, wherein the separation space and/or a space between the holding member and the second catalyst layer can have its pressure adjusted; and

a gas outlet through which the vapor component is discharged from the separation space.

44. (previously presented) A hydrotreating unit according to claim 43, comprising a flow meter and flow adjustment valve operatively connected to said gas outlet for the adjustment of pressure in the separation space and/or the space between the holding member and the second catalyst layer.

45. (previously presented) A hydrotreating unit according to claim 43, further comprising means for recycling hydrogen from the discharged vapor component into the hydrogen introduction part.

46. (previously presented) A hydrotreating method according to claim 28, wherein the holding member is a valve tray.

47. (cancelled).

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48. (cancelled).